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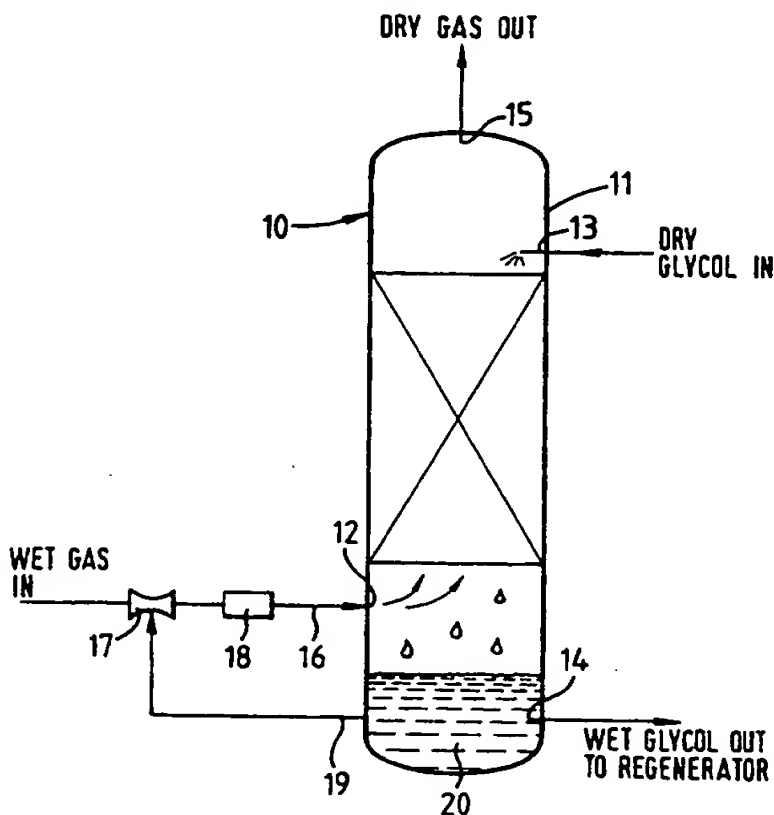
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**None**

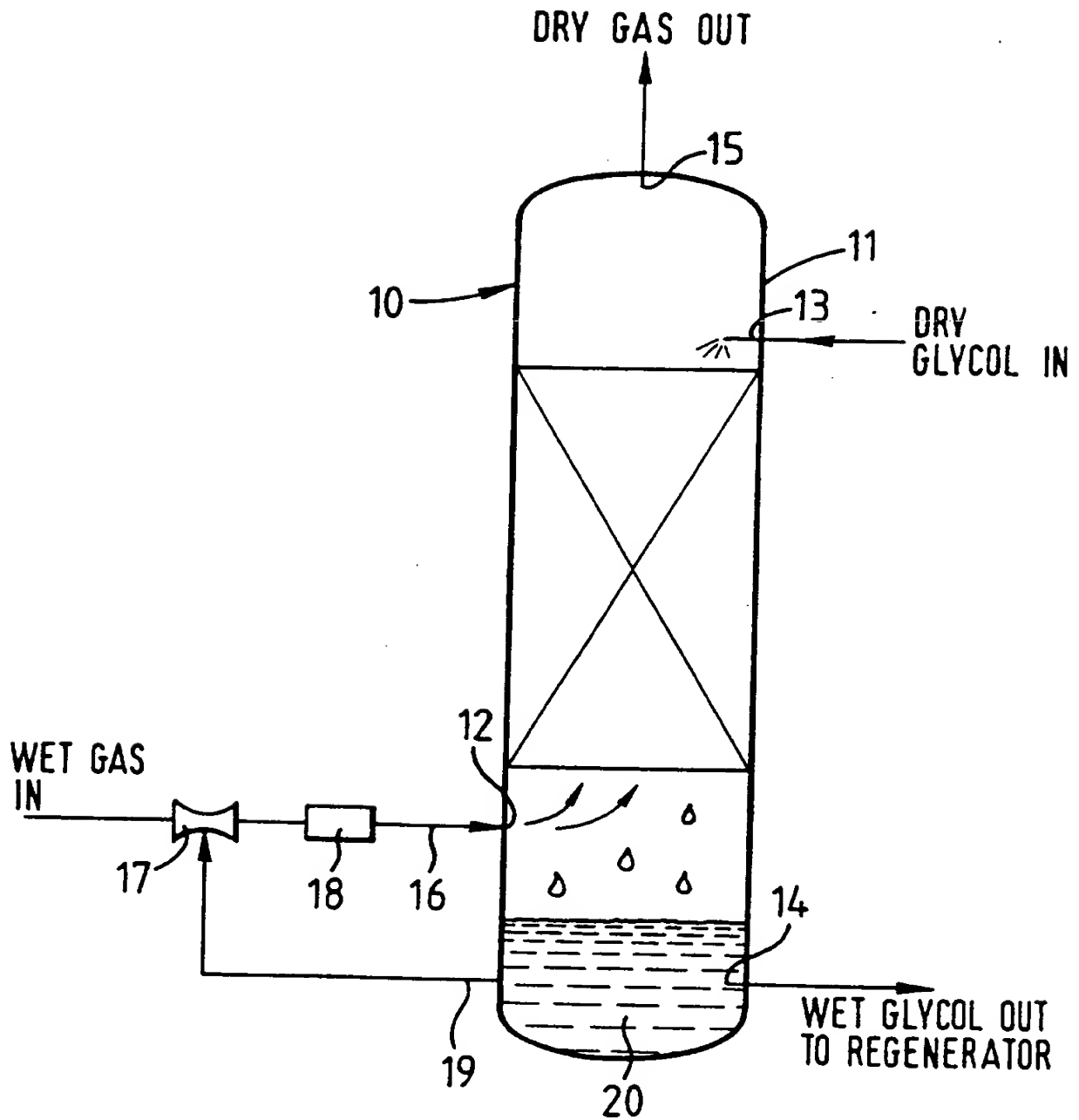
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## (54) Gas dehydration process

(57) A wet gas inlet to a contactor (scrubbing) vessel (10) is provided with a recycle line (19) connected to a lower portion of the interior of the vessel (10) and includes a venturi/mixer (17,18) which sucks glycol from inside the vessel (10) into the feed gas line where it effects a pre-wash thereby facilitating requirement of a vessel (10) of smaller vertical dimension than has been required hitherto.



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### Gas Dehydration Process

This invention relates to a method of and apparatus for effecting a desiccant pre-wash of a wet gas to a contactor of a gas dehydration plant.

It is known to provide a contactor (scrubbing) vessel for effecting dehydration of natural gas using glycol as the desiccant. The contactor comprises a vertical cylindrical column having a lower first inlet for receiving the wet gas, an upper second inlet for receiving lean (dry) glycol and an upper outlet for drawing off dry gas from the contactor. The wet gas is drawn upwardly through the contactor and mixes with the glycol. Moisture removed from the gas resulting from mixture with the glycol collects at the base of the contactor as a reservoir of rich (wet) glycol which is tapped and recycled through a regenerator to the upper second inlet.

It is necessary for the contactor to be of substantial vertical dimension to ensure that the dehydration process is complete when the gas is drawn off from the contactor.

According to the present invention, there is provided a method of effecting a desiccant pre-wash of a wet gas fed to a contactor of a gas dehydration plant comprising the step of drawing from the contactor a reservoir of a solution of the desiccant and mixing the solution with the gas prior to feeding the gas to the contactor.

Also according to the present invention, there is provided apparatus for carrying out the method. The apparatus may include a venturi mixing device and, preferably, the desiccant is glycol.

Therefore, the invention provides a venturi mixing device located in the feed gas line to the contactor (scrubbing) vessel which sucks glycol from the base of the contactor into the feed gas line where it effects a pre-wash thereby facilitating requirement of a contactor of smaller vertical dimension than has been required hitherto. Such a reduced dimension contactor would be more economical to manufacture than a comparable larger dimension contactor known hitherto.

Following is a description, by way of example only and with reference to the accompanying drawing, which is a diagrammatic representation, of one method of carrying the invention into effect.

Referring to the drawing, there is shown a contactor 10 comprising a vertical cylindrical column 11 having a lower first inlet 12, an upper second inlet 13, a lower first outlet 14 below the lower first inlet 12 and an upper second outlet 15 above the upper second inlet 13. The lower first inlet 12 has connected thereto a feed pipeline 16.

The feed line 16 includes a venturi mixing device comprising a venturi component 17 and a mixing component 18. The venturi

mixing device 17, 18 is also in communication with the interior of the column 11 by means of a recycle pipeline 19 which is connected to a lower portion of the column 11 below the lower first inlet 12. The venturi mixing device 17, 18 may or may not be constructed as separate venturi 17 and mixing 18 components.

The arrangement is such that wet gas is supplied to the contactor 10 through the feed line 16 and enters the column 11 through the lower first inlet 12 and is drawn upwardly of the column 11. The upper second inlet 13 is supplied with lean (dry) glycol which mixes with the wet gas removing moisture therefrom. The dried gas is vented from the column 11 through the upper second outlet 15 and the glycol droplets collect at the base of the column 11 as a reservoir of wet (rich) glycol 20. The rich glycol 20 is tapped through the lower first outlet 14 and is recycled through a regenerator (not shown) to the upper second inlet 13.

The reservoir of rich glycol 20 is subjected to the action of the venturi mixing device 17, 18 through the recycle line 19 such that a supply of rich glycol is sucked from the reservoir 20 and mixed in the device 18 with the incoming wet gas drawn through the feed line 16. This mixing provides a pre-wash of the incoming gas causing an initial dehydration effect before the gas enters the column 11 so that, as the gas enters the column 11 through the lower first inlet 12, water and glycol particles precipitate from the gas and collect in the

reservoir of rich glycol 20. The arrangement thus increases efficiency compared with a contactor of comparable performance not provided with the invention.

Claims

1. A method of effecting a desiccant pre-wash of a wet gas fed to a contactor of a gas dehydration plant comprising the step of drawing from the contactor a reservoir of solution of the desiccant and mixing the solution with the gas prior to feeding the gas to the contactor.
2. Apparatus for carrying out the method claimed in Claim 1 comprising a recycle pipeline connecting the reservoir to a gas feed input pipeline of the contactor.
3. Apparatus as claimed in Claim 2 wherein the input pipeline includes a venturi mixing device for mixing the gas and the solution.
4. Apparatus as claimed in Claim 3 wherein the recycle pipeline is connected to the device.
5. A method of effecting a desiccant pre-wash of a wet gas fed to a contactor of a gas dehydration plant substantially as hereinbefore described and as illustrated in the accompanying drawing.
6. Apparatus for effecting a desiccant pre-wash of a wet gas fed to a contactor of a gas dehydration plant substantially as hereinbefore described and as illustrated in the accompanying drawing.

**Relevant Technical Fields**

(i) UK Cl (Ed.N) B1R (RAB, RAC, RAF, RAJ), C5E (EPA, EPD)

(ii) Int Cl (Ed.6) C10L 3/10, B01D 47/00 47/06 47/10 47/14

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Search Examiner  
P N DAVEY

Date of completion of Search  
6 JULY 1995

Documents considered relevant  
following a search in respect of  
Claims :-  
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**Categories of documents**

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Category	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

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